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THERAPEUTICAL IMPORTANCE

OF RECENT VIEWS OF THE

NATURE AND STRUCTURE

OF

CANCER.

BY

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MORBID ANATOMY IN THE SCHOOL.

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FEW points of abstract surgical pathology have been more keenly discussed of late than the *theory of the nature* of cancer; and perhaps few practical subjects have been more frequently and hotly canvassed during the same period than the *treatment* of cancer, more especially with regard to the propriety or otherwise of ablation of cancerous tumours with the knife.

And yet the result of all these discussions seems to be, that upon the first point, the theory of the disease, opinions still widely differ; and that upon the second, whilst both schools of theorists agree in the admission that we have failed as yet to discover any cure for cancer, opinions are about equally divided upon the subject of its relief or aggravation by any of the measures at present in common use.

Nor is the gravity of the situation rendered less painfully manifest by the reflection that so greatly does personal prejudice appear to influence the judgment in this matter, that the majority of operating surgeons are strongly in favour of the knife, whilst the majority of physicians and surgeons, little used to operations, declaim against this remedy. It is to be further noted that statistics are quoted by both sides, and that the difference of

opinion is guided by such subtle influences that many surgeons are known to have held opposite views on the subject at different periods of life.

Now, it is clear that with diametrically opposed opinions on a subject of so vast importance as the treatment of cancer, there must be some fallacy underlying the statistics which are quoted alike by both sides, or, perchance, some scepticism or misconception of the facts coming under the ken of the pathologist, which a little careful and dispassionate consideration of the matter, from an anatomical point of view, may serve to clear up. The time, indeed, seems to have come when we may well pause and endeavour to ascertain how far and in what respects the recent modifications of our views of the nature and origin of cancer should affect our treatment of the disease.

It will be the object of this article, therefore, briefly to review our present position in this regard, and to endeavour to ascertain whether we may not fairly deduce from the pathological facts already recorded, some definite principles of treatment which may approve themselves alike to the practical surgeon and the theorist.

It is obvious, however, that in such a paper as the present we must be content to use the term 'cancer' in its broadest sense, as synonymous with the word 'malignant,' by which is implied a property of certain morbid growths to flourish at the expense of the tissues in which they appear, to return more or less speedily after removal, to infect the neighbouring lymphatic glands, and finally to be accompanied by similar new growths in various and remote portions of the body. These terrible qualities being common to many different forms of new growth—although perchance in varying degrees of severity—it is obviously inconvenient to apply any of the arguments to be here set forth to any one form of neoplasm, as *e.g.* carcinoma proper as met with in the scirrhus breast.

Taking, then, the word cancer to mean malignancy, let us proceed to consider the theories of its nature.

[But whilst thus disregarding for the moment the peculiar anatomical formation of the several varieties of malignant tumours, I am anxious to guard myself against the imputation of not believing sufficiently in their real importance.

It has been said that it is puerile to pay very much attention to the minute structural elements of a morbid growth; that the form of the component cells teaches one little or nothing of the attributes of the tumour exhibiting them; that similar cells are to be found in the most diverse growths, and that one might as well expect to be able to sketch out the future dog or horse from an inspection of the cells constituting the early embryo, as to predicate the course and symptoms of a morbid growth by observation of its cellular elements. It may be that we are perhaps laying too great stress upon the minute structure of tumours at the present day, but we are certainly making great advances in diagnosis thereby, and we may not unreasonably hope to make corresponding advances in therapeutics. For it is to be observed that although the particular shape and size of each cell may be unimportant, yet the general appearance and arrangement of these vary with great regularity in the several classes of new growth. And the minute structure of a tiny tumour differs from that of an immature ovum in the important circumstance that the neoplasm very early takes on the structure which is to constitute without any further development the great bulk of the possibly enormous and fatal tumour. It is true that in the "granulation stage" of certain of the more malignant new formations very little can be predicated—the clustered round corpuscles may be the first indications of an inflammatory process or of the most deadly cancer; but as a matter of fact surgeons never meet with tumours in this stage without having close by a structure more pronounced if not as fully differentiated as it is destined to become. And hence, if we are ever to discriminate fairly between the several forms of tumours, we must not neglect the careful inspection of their minute structure; for it will be only from the time that such accurate distinctions are constantly made that statistics will be of any real value in advancing our knowledge of the clinical history of new growths.]

There are two leading views of the nature of cancer which may be briefly characterised as that which regards it as an affection *purely constitutional*, and that which ascribes to it a *purely local* character. Of these two views the latter is by far the more recent; but although it has been warmly adopted by

some few English surgeons, notably by Mr. De Morgan,¹ and by the late C. H. Moore,² it cannot be said to be generally welcomed on this side of the channel, though long held by some of the leading pathologists of Germany.³

Without attempting to consider all the minor differences of detail in the opinions which may be held by individuals in either of these schools, we may sum up the doctrine of the first class of writers thus:—that cancer is as essentially a constitutional or blood disease as gout or syphilis, and with analogous local manifestations; and the corollary usually appended implies that one might as well hope to eradicate gout or syphilis by amputating the inflamed toe or cutting out the indurated chancre, as to stem the course of cancer by cutting off the tumour.

Of course the physical proofs of the existence of a constitutional disease cannot be furnished, but the chain of other evidence adduced in its support is at first sight very striking.

We have presented to us (1) a disease unquestionably hereditary in many instances; (2) an inveterate resistance to any attempt at removal, as shown by a return of the growth *in situ*, sometimes even after a lapse of years; (3) a tendency to the production of secondary growths in certain parts of the body, which is apparently inexplicable by any other theory; and (4) a cachexia, which of itself is said to be sufficient to kill the patient, irrespective of the local malady.

¹ "On the Origin of Cancer;" a series of Papers by Campbell De Morgan, F.R.S., in the 'Lancet,' July, 1871.

² "The Antecedents of Cancer." By Charles H. Moore, F.R.C.S., 1865. "Cancer." Article by C. H. Moore, in 2nd Edit. of 'Holmes's System of Surgery,' 1870.

³ Since writing the above sentence it has been gratifying to note the thorough adhesion of the learned President of the Clinical Society to this doctrine. At a meeting of this society, held October 13th, 1871, at which the subject of the local nature of cancer was discussed, Dr. Gull, in a remarkable speech, derided the notion of cancer being a "constitutional" disease, and expressed his own conviction that cancer is at first an absolutely local growth, which, by diffusion of its minute elements, subsequently affects the body in numerous places. Sir Thomas Watson also, in the last edition of his 'Lectures on the Principles and Practice of Physic,' seems to favour this view more distinctly than in former years. The importance of the point being thus augmented by the support of so high authorities, it is the more necessary that the doctrine itself should receive general and critical attention.

On the other hand, those who are opposed to this view maintain that cancer is, in the first instance, as purely a local disorder as the most innocent tumour; but that, owing to certain peculiarities of structure, its elements may become diffused throughout the body, chiefly by means of the lymph or blood streams, and so give rise to other or secondary growths in distant parts, and that if the first tumour be only sufficiently removed before this wide dispersion be effected, cancer is as eradicable as any fatty or bony growth. To use a homely illustration, according to this theory, a cancer in the human body may be compared to a thistle in a cornfield. If this weed be allowed to remain until the flower-head has passed to its stage of ripe, feathery seeds, these are wafted hither and thither, and, taking root, become so intimately and largely mingled with the corn that the complete removal of the nuisance is impossible without greatly endangering the whole crop. But if the original plant be removed at once all this danger is avoided. And the illustration may further serve to show what is meant by complete extirpation of the cancerous tumour, and its bearing upon the theory of the nature of cancer. For if the thistle be merely cut down it will surely sooner or later again flourish and scatter its seeds far and wide; and even if small portions of its root, or rhizome, be suffered to remain, these may be the source of a return of all the mischief, though after a longer period.

In like manner it is argued that manifestly incomplete removal of a cancerous growth can never be of any permanent service; that injudicious tampering with it may be as the shaking of the thistle down and the dispersion of the fatal seeds; and that even very careful removal may too often fail to extirpate all the tiny offshoots which if left behind will, after a longer or shorter interval, develop a fresh and virulent cancer.

Such are the two theories of the nature of the disease commonly received, and since the *local* theory is gaining ground rapidly with the younger pathologists of the day, it may be well to examine from their point of view the arguments of the older school *seriatim*.

That cancer is undoubtedly hereditary in many cases proves nothing either way, although it is a very favourite argument of those who contend for the constitutional aspect of the question. When we reflect that such absolutely local blemishes as a sixth

toe, a clubfoot, an early disposition to gray hair, and the like, are oftentimes clearly hereditary, there is no difficulty in understanding that an hereditary cancerous tumour may be quite as local in its nature; and, indeed, it has been pointed out by Mr. De Morgan¹ that warts and even atheromatous tumours are occasionally distinctly to be traced in families. Cases of hereditary tendency to the formation of fatty tumours have been also recorded.

The great proneness to return in the neighbourhood of the scar left by the operation for the removal of the first growth is also capable of abundant explanation in these days of microscopic research, without the necessity of presupposing any general taint of the system. Indeed, when we reflect upon the way in which many of these malignant tumours are built up of exceedingly minute cells, bound together in the loosest manner, or even (as in scirrhus carcinoma) floating freely in a thin fluid, each cell possessing independent and indefinite powers of reproduction, and even as it would seem being capable of inducing a like morbid development in the physiological tissues amongst which it is implanted, it seems more easy to explain the frequent recurrence of such growths than their occasional complete removal. The recent experiments on skin grafting for superficial ulcers must have brought this point forcibly home to the surgeons who have practised the method.

The occurrence of secondary growths is a much stronger fact in support of the theory of the constitutional nature of cancer, although much light has been thrown upon this point also by the pathological observations of the last few years. The contamination of the nearest chain of lymphatic glands is, of course, readily intelligible, but the more remote growths as in the brain or distant limb are not capable of so facile an interpretation. No doubt the doctrine of embolism as set forth by Dr. Kirkes and amplified by many subsequent observers has gone far to remove from the diffusion of cancer the mystery which formerly enshrouded it, and the great majority of secondary growths may be explained by a transference of cells or fluid from the primary tumour by either the lymph- or blood-channels. These modes of extension of the disease have been already too abundantly illustrated to need any further confirmation here. Perhaps the

¹ 'Lancet,' vol. ii, 1871, p. 154.

most perfect and convincing example of transference of tumour elements by the blood is furnished by Sir James Paget's striking case of primary cancer of the liver in which the growths were stained bright yellow by bile, and in which numerous secondary growths of the same structure and peculiar colour were found scattered through the lungs and blocking the branches of the pulmonary artery.¹ But some exceptional instances are not so obviously capable of such a solution, and it is these cases which are mainly relied upon by those who hold to the constitutional essence of the disease.

It has been argued by those seeking to establish the local origin of cancer, on the other hand, that the disease in its secondary form never, or extremely rarely, attacks any of the common seats of its primary manifestation.

My own observations, however, have hitherto not coincided with those of Mr. Sibley² in this respect. In 109 cases of cancer of the breast recorded by me in the annual statistical tables of the cancer department of the Middlesex Hospital, the other breast was affected in twelve instances, *i. e.* in the proportion of 11 per cent., whilst I have once seen a patient with cancer of the uterus and both breasts at the same time. In these same 109 cases the lungs were the seat of secondary deposit eight times, and the liver fourteen, so that even making allowance for imperfect examinations in which the other breast might be noted when the lungs or liver could not be examined, the occurrence of secondary disease in the opposite breast is too common an event to permit of any useful deduction being drawn as to the local origin of cancer, from the fact of common primary seats of cancer being rarely selected for secondary manifestations.

A heavy blow seems to be aimed at the theory of the local origin of cancer in the recent researches of Cohnheim and Recklinghausen upon the nature and properties of the wandering cells or white corpuscles of the blood. Without following up too closely the tangled web of inferences which may be and have been drawn from the observations on this subject, it may be at least stated that it is held by many as extremely probable that the tiny clusters of roundish granular corpuscles, which

¹ 'Lectures on Surgical Pathology,' 2nd Edit., 1863, p. 803.

² 'Med.-Chir. Trans.,' vol. xlii.

under the names of "indifferent" and "granulation" tissue, have long been recognised as the first indications of a developing cancer, are really neither more nor less than white blood-corpuscles which, in obedience to some impulse not clearly understood, have passed through the vessel walls into the tissue beyond. To those who had adopted after much consideration the views of Virchow as to the almost exclusive part played in all these changes by the ubiquitous connective-tissue corpuscles the more recent observations on the subject have come with such startling novelty, that we are hardly yet in a position to give in an unreserved adhesion to either doctrine. The appearance of multiplying connective tissue nuclei, and even of the nuclei of striped muscle, in the neighbourhood of a growing cancer seems too real to be readily distrusted. Meantime it is clear that if these first elements of a cancerous tumour are really white corpuscles, which have issued from the blood-vessels in the vicinity, cancer may be a *blood disease* in a more absolute sense of the term than has been yet conceived, although its local manifestations may be extremely limited.

Such an admission would give enormous weight to the view of a special dyscrasia against which we must hopelessly strive to fight. Might we not, then, argue, on the other hand, that as the same corpuscles play an equally prominent part in any trifling inflammatory or reparative action—as the healing of a lancet prick, or the formation of a boil—the force which determines their special development when once outside the vessel, must depend solely upon some local change or aptitude or force in the tissues amongst which they are extravasated?¹ Such a sugges-

¹ Thus, Sir James Paget, writing long before the share taken by the white blood-corpuscles in the development of tumours was recognised, insisted strongly upon the necessity for the coexistence of two things in the formation of any cancer, "namely, a certain morbid material in the blood, and some part appropriate to be the seat of a growth incorporating that material, some place in which the morbid material may assume or enter into organic structure." *Op. cit.*, p. 767.

The necessity for assuming the coexistence of these two conditions, neither of which is capable of distinct manifestation, in order to explain the appearance of a given malignant growth, seems to be one of the greatest difficulties in the path of the 'constitutionalist,' for it is not easy to conceive that with a specific poison circulating in the blood an appropriate habitat can only be found in a single minute portion of one breast or one tiny region of connective tissue. It is as though the poison of variola were to be limited in its manifestation for a long time to a single

tion would be, at least, more consistent with the facts of the case, for we have never—so far as we can accurately observe—the phenomenon presented to us of more than one cancerous tumour appearing at the same time as primary evidence of the disease.

A strong argument in behalf of the *local* theory of cancer is furnished by the consideration of the several varieties of malignant growths, and their respective malignant properties. It is for this reason that it is so unwise to limit such an inquiry as that in which we are now engaged to carcinoma anatomically defined, since such a limitation deprives the question of more than one important aspect. If, for instance, we attempt to range the different tumours in the order of their malignancy, we shall find that, in spite of the great difficulties in the way of an absolute adjustment of the conflicting claims before us, *just those forms of growth are most liable to general diffusion which from their physical structure might be so predicated*, any apparently opposing facts being explained by the *seat* of the growth. This is a statement so important to the point at issue that it may be well to dwell upon it more in detail. The merely recurrent growths have been already referred to as readily explicable by the microscopic evidence of a diffusion of their minute elements amongst the neighbouring tissues far greater than is at all obvious to the unaided senses, and they need not be included here. Of the growths exhibiting more particularly the higher degrees of malignancy, the most important are hard and soft carcinoma, sarcoma, epithelioma, lymphoma, and (rarely) glioma. Of these, lymphatic gland contamination is observed especially in carcinoma and epithelioma. (Lymphoma, as probably a growth exclusively of lymph-gland origin, may be excluded.) The researches of MM. Cornil and Ranvier have shown that into the spaces filled with loose cells, characteristic of carcinoma, the mouths of lymphatic vessels open straight.¹ Hence the inoculation of the nearest glands with the cells or juices of a carcinoma may be considered as an almost unpreventible and clearly intelligible process. It is not so clear in regard of

pustule. For the development of a new growth it is more easy to believe that the local change is the only really essential condition.

¹ 'Manuel d'Histologie Pathologique,' par V. Cornil et L. Ranvier, Paris, 1869, p. 175.

epithelioma, nor is the gland infection nearly so frequent in this case. But where it does occur, especially in the lips, tongue, the genital organs, and, perhaps, the rectum, it is to be noted that the epithelioma is situated on a part much subjected to constant movement, and so naturally moist as to render the growth softer and more infiltrating than it is apt to be in other localities as the cheek, or the edge of an ulcer on the shin.¹

The effect of locality in influencing the malignancy of new growths is perhaps hardly sufficiently considered by surgeons. We see an ulcer with elements of epithelioma in its edge and base, situated upon the temple or cheek, and we marvel at its slow and insidious progress, a progress, often so slow that many years may elapse before much of the face is consumed in the advancing havoc; whilst in these cases it is the rare exception to find any contamination of the neighbouring lymphatic glands or remote viscera. But let the same epitheliomatous ulceration attack the lip or the tongue, and at once we have to deal with a rapidly progressive disease, liable, in a proportion of about fifty per cent. of cases, to infect the glands in the vicinity, if not more remote parts also.

In support of this statement reference may be made to the following analysis of seventy-three cases of epithelioma, of which careful notes were made by myself, and which are included in the annual statistical tables of the cancer practice of the Middlesex Hospital before referred to. Cases of uterine cancer are not included in this table on account of the uncertainty often attending the microscopic diagnosis of cancer in this organ.

¹ A striking illustration of the truth of this suggestion is furnished by the following example from my out-patient room at St. Thomas's Hospital. A draper's assistant, about 60 years of age, noticed, in August, 1871, a small sore place on the frænum of the tongue. *Within one month* the glands below the jaw enlarged, and he then consulted a surgeon; but being told that the swelling would soon subside, he paid little attention to it until the increasing pain and tenderness drove him for further advice elsewhere. I saw him within three months of the time at which he had first noted the sore, and already the ulcer had assumed well-marked characters of epithelioma, three or four glands below the jaw were diseased and inflamed, and there was induration and fixation of the glands above the clavicle. In fact, the disease had already extended beyond the reach of surgical interference, although the man was still in excellent general health, and most unwilling to accept the grave prognosis which it was right to put before him.

Locality of the epithelioma (including four cases of so-called "rodent cancer").		Number of cases in which neighbouring lymphatic glands were implicated.	Number of cases in which more remote parts were also diseased.
Cheek or face . . .	23	5	2
Lip	8	4	1
Tongue	19	11	1
Scrotum	4
Vulva	3	2	...
Penis	3	2	...
Rectum	3	1	...
Leg	3
Hand	2	2	1
Foot	1
Bladder	1
Heel	1	1	1
Clitoris	1	1	...
Groin	1	1	...
	<hr/> 73	<hr/> 30	<hr/> 6

It will be remarked in this table that the cases showing contamination of the glands and other parts, are precisely those in which the growth is subjected to the greatest amount of movement. Thus, in the lip, tongue, genitals, groin, hand, and heel, the glands were affected in from 50 to 100 per cent. of the whole number of cases, whilst the disease attacking the less movable parts of the face spread to the glands in a proportion of only 21·7 cases; and in the leg and scrotum remained absolutely local. I have selected epithelioma for this comparison because it is a form of new growth, whose malignancy seems to me to depend almost entirely upon the circumstances of its locality, and partly also because its genuine malignancy under untoward conditions, has been generally so little recognised, that a late eminent writer upon cancer¹ altogether refuses the name to this neoplasm.

In illustration of the comparative malignancy of cancer, sarcoma, and epithelioma, when an extremely movable and moist part is invaded by them, I would refer to some recent observations upon uterine cancer, in which I have made special reference to this point.²

Sarcoma, excepting those singular instances of largely diffused melanosis, hardly ever infects the lymphatic glands.

¹ The late Maurice H. Collis, of Dublin.

² "Cases illustrating certain points in the Pathology of Cancer of the Uterus," 'Pathological Transactions,' vol. xxi, 1870.

For the more fatal property of wide diffusion to distant parts, the structure of earcinoma with its freely floating cells in tiny reservoirs of thin fluid is eminently adapted. For the rest it will be seen that the softest, most quickly growing, and infiltrating growths, are at the same time, and apparently in direct proportion to the existence of these qualities in any given specimens, most liable to general spreading of the disease. This is true also of the more rarely malignant growths as soft enchondroma and myxoma. A capsule to the growth (much more rare in sareoma than is often taught), whether furnished by condensed connective tissue around it, or by the accidental envelopment by tough fibrous structures (as in the case of a growth springing up within a joint or limited by tough fasciæ), is almost equally a protective against the occurrence of remote growths in all these varieties of neoplasm.

That we occasionally meet with instances of secondary tumours so far removed from all apparent anatomical communication with the primary growth, should only stimulate us to observe with the greater scrutiny the means whereby the phenomenon is brought about—although, of course, we can always take refuge, as respects these exceptional cases, in the assumption that the two growths are absolutely independent of one another, and have appeared just as a couple of sebaceous or fatty tumours occasionally develop at widely separated parts.

Turning now to the fourth argument, the cachexia which is of itself sufficient to slay, even without the local manifestation, it might be sufficient to reply that the existence of such a cachexia, save as a general deterioration of health due to a grave local malady, is a pure assumption, which the considerations just put forward tend to contradict.¹ But it has been contended

¹ "It (cancerous cachexia) has therefore no necessary connection with the malady, but is only a result of the effect of the malady upon the constitution."—Prof. Humphry, on "Cancer of the Testicle," 'Holmes's System of Surgery,' vol. v, p. 143.

"Nothing can be more erroneous than the belief entertained by those who have not had much experience of the disease that there is a cachectic condition in the early stages of cancer."—C. De Morgan, 'Lancet,' vol. ii, 1871, p. 41.

"I look upon cachexia as an evidence of disease interfering with some of the principal viscera, and preventing the due renewal or purification of the blood, which is their function; if the disease be cancer, the cachexia will be evidence of it; but it will not *per se* enable us to distinguish between cancer and other internal or hidden morbid actions."—'On Cancer and the Tumours analogous to it,' by Maurice H. Collis, M.B., F.R.C.S.I., 1864, p. 141.

not only that patients have died of this dyscrasia irrespective of the local ailment, but also that the local growth forms, as it were, a loophole for the escape of the poison from the system—an excreting gland without whose aid the patient would speedily succumb to the virus circulating through his frame.

This view, however, requires a corresponding belief in the beneficial effect upon the patient of the development of the tumour itself, and in the immediate ill effects of its removal by operation which the attentive examination of the majority of ordinary cases of cancer precludes us from recognising.

The appearances which we are accustomed to associate with the existence of the cancerous dyscrasia, may often be seen in very different complaints, as chronic hip disease, chronic pyæmia, certain uterine disorders, and other ailments attended by frequent losses of blood or prostration of strength, and these appearances when they do present themselves in cancer, seem to prove only that the sufferer is beginning to languish terribly under the scourge with which he is attacked.

A calm survey of the two opposite views of the nature of cancer, and of the facts which are adduced in support of them, seems to leave us in about this position:—that while it is impossible absolutely to deny the existence of a special dyscrasia as the cause of the appearance of malignant tumours, the evidence in its favour will not bear careful scrutiny, although it may be admitted that certain individuals and even families exhibit a remarkable predisposition to the occurrence of these growths, just as a similar predisposition may be shown to the appearance of fatty growths, warts, or other such local defects of nutrition: that owing to appreciable physical causes—as the special arrangement of structural elements, the part of the body attacked, &c.—certain tumours are more prone to malignancy than others: that whether the original growth be absolutely local or depending on general changes in the system, a stage may be at length reached in which there may be, indeed, an incurable and necessarily fatal blood contamination: and finally, that as all the real evidence before us goes to prove that it is in any case the *local tumours or ulcers which kill*,—either by invasion of vital organs, or by the breaking-up of health caused by excessive hæmorrhages, pain, and exhausting

and foetid discharge from the primary seat of the disease—these should be completely removed when possible.

Of course the zeal and hopefulness with which the surgeon sets about this task will depend in a great measure upon the particular theory which he may hold, but it seems illogical to contend that because a man believes that profound constitutional changes have caused the appearance of a terrible local mischief, therefore he need not trouble to attempt the removal of the dire result of a cause which is beyond his control. Even if he feels confident of the system of his patient being saturated with the poison, he will yet endeavour to obviate the more tangible manifestations, whenever this can be done without incurring a yet greater risk.

If, on the other hand, the surgeon be persuaded that all the formerly mysterious phenomena of cancer are now explicable by local changes readily appreciable to his senses, and to a great extent under his control, he will arduously seek for some means by which to eradicate the malady in its more harmless stage.

In the endeavours to establish a sound therapeutical application of these modern doctrines of the pathology of cancer, one most comforting assurance is at once presented to us. It is this: We have seen that malignancy is by no means the exclusive property of one form of new growth, but it is shared to some extent by nearly all the tumours with which we are acquainted. We have further seen that the degree of malignancy appears mainly to depend upon such physical conditions as the minute structure of the tumour, its consistence, and the amount of moisture and movement of the affected locality. Clearly, then, we need not isolate cancers from the other new growths in the selection of our remedial measures. There is no apparent reason why a remedy, which will remove an innocent tumour, will not be equally efficacious, as regards its action upon local overgrowth, when applied to a malignant one; any circumstances (as extensive local infiltration, or early gland contamination) likely to interfere with the successful issue, may be readily taken into consideration, and the treatment and prognosis varied accordingly.

Hence there is nothing specific distinguishing cancerous from other tumours which should prevent us from applying

other methods of treatment to such cases as for any reason happen to be ill-suited for operation. To speak of the knife, as some distinguished surgeons have done, as the only trustworthy resource for the cancerous patient—and this, too, in the face of the unsatisfactory results hitherto achieved by this means—and to rank with quacks those who earnestly seek for better remedies, is calculated to advance neither our knowledge of disease, nor our faith in therapeutics.

Lastly, there is no reason in the world why we should refuse to admit that a cancer has been cured or permanently removed. It has become quite common to hear surgeons say of a tumour which has not returned after extirpation some years previously, "I suppose it was not really cancer, as it has not come back, but it had certainly all the ordinary characters of cancer." In like manner it is frequently said of reputed cures of cancer by pressure, or caustic, or by other means, that the tumours could not have been cancerous simply *because* they disappeared under the treatment. It is surely time that we give up these notions of the specific and inevitably mortal character of malignant tumours, for such doctrines are not only to be deprecated on account of the insufficiency of pathological facts to be urged in their support, but for the far more serious reason that they stand in the way of any advance in rational therapeutics.

Nevertheless, when we come to consider the question of treatment more carefully, complete removal of the tumour with the knife is the first and obvious expedient of the surgeon, and indeed, where it can be safely and effectually accomplished, this seems to be the distinct indication. But it is unfortunately the fact that complete removal is only certainly possible in a very early stage of the disease.

Partial removal is clearly inutile—if not absolutely hurtful—from any point of view, save under very exceptional circumstances.

But since patients seldom seek advice until the earliest stage has already passed, what is now indicated?

Still, as it would seem, complete removal if possible; but now a large amount of apparently healthy tissue must be taken away with the tumour and any infected glands must be extirpated at the same time.

This is the operation which is most frequently called for, and

the defective performance of which is to be blamed for much of the opprobrium attaching to surgical interference in cancer.

It is, however, very important to bear in mind that this operation, if effectually done, is often necessarily hazardous to life. How hazardous we have no statistics to show, for its danger has been misrepresented by the invariable custom of grouping together in the same statistical statements these larger with the comparatively trifling incisions of less permanent value, or which are sufficient in an earlier stage of the disease.

This point has been always overlooked in quoting the mortality from the operation of amputation of the scirrhus breast, and the consequence has been that a variety of useless operations have been added to a few effective ones with the result of lowering the rate of mortality of the whole.

But this grave error, which has deceived surgeons by permitting them to under-estimate the risks to life of these operations, is not the only evil which has resulted from this custom. The profession being thus guided by the results of operations clearly inadequate for the removal of the complaint (as when enlarged glands are left in the axilla, or portions of the breast or thickened skin are left behind, not to speak here of the strange practice of intentionally removing *most* of a tumour only, and leaving the nipple or hardened muscle to spread the disease again), a great and unjust prejudice has been excited against the use of the knife at all, the erroneous impression of the small risk to life being overweighed by the almost constant return of the disease after a longer or shorter interval.

It is difficult to over-estimate the importance of these considerations, for they strike at the root of all our present practice for the relief or cure of the most terrible disease with which the surgeon has to grapple. Taking the most favorable view of the nature of cancer—that it is an absolutely local change, but extending far beyond its obvious limits, and very prone to disseminate itself widely unless removed at an early period—it is yet evident that we have to combat a malady which will yield to no half measures. The knife which is to cure it must cut widely and deeply to effect its purpose. There must be no piece-meal removal which may scatter the seeds of the disease in the wound; nor must any the least suspicious bit be left behind. The practice of sponging into the fresh operation

wound a solution of ehloride of zinc, as first suggested by Mr. De Morgan, seems also to be strongly indicated, unless the surgeon prefers to use earbolic acid, or any other of the numerous substitutes which, under the title of "disinfectants," have been zealously advocated since ehloride of zine was first used in this way at the Middlesex Hospital. It will do no good to shut our eyes to the gravity of such an operation.¹ Let its increased risks be set against its greatly increased efficacy, and if the risks are found to outweigh the benefits, then let other means less dangerous be sought.

It is probable that in a large proportion of the cases coming under the surgeon's care, some less immediately dangerous therapeutical measure might be profitably substituted.

Caustics have seemed to some to meet this end to a great extent, and their employment is certainly attended with infinitely less risk to life than extensive cutting operations.² The intolerable and enduring pain attending their use has hitherto contributed mainly to their neglect by English surgeons. From some reason not easy to comprehend the practice of congealing the part before the application of the caustic, although found to be completely effectual in the instances in which it has been tried,³ has not yet been sufficiently widely tested to permit this combination to be ranked amongst the reliable measures for the relief of cancer; but much remains to be done in this direction, more particularly in those cases where the disease is conveniently located for such an application, and where the patient has an unconquerable dread of the knife.

No doubt any remedy which affects the system generally

¹ "Since the operation has been done in more advanced disease, and the risk increased by more freely opening the axilla, worse cases have enjoyed an extension of health over three and four years, but the mortality has doubled. In one year the deaths amounted to three in twelve."—"Cancer," by the late C. H. Moore, Holmes's 'System of Surgery,' 2nd edit. vol. i, p. 599.

² "So far as our observation goes, this proceeding by caustics is altogether free from risk to life, and from liability to blood disease."—"Report of the Surgical Staff of the Middlesex Hospital, On the Treatment of Cancer (by Chloride of Zinc Paste)," 1857, p. 44.

³ "Congelation may be employed with great advantage in conjunction with caustic, of which it diminishes the pain, without interfering with its action."—"Cancer," by the late C. H. Moore, 'Holmes's System of Surgery,' 2nd edit., vol. i, p. 609.

must, to some extent, affect any local ailment which may be present, and in this sense general remedies may be of some service in cancer. But it does not seem likely that we shall readily succeed in finding a drug whose action shall be so concentrated upon a given limited portion of the body as to arrest in that part the excessive and ill-directed cell proliferation which is so vigorously going on. It seems to be a peculiarity of all morbid growths (as distinct from mere inflammatory tissue changes), that they flourish quite independently of the general nutrition of the body, and at the expense of the normal tissues from which the necessary pabulum is diverted.

Failing, then, general remedies, we should seek such a measure as will aim at correcting the local growth, by supplying such condition or combination of conditions as are found to retard physiological growth and development.

The present despairing custom of anointing the surface of the swelling or ulcer with soothing unguents, or of fomenting, or of the application of the various bland lotions or liniments in common use must be regarded as mere *placebo* treatment—useful, indeed, in its way for the alleviation of some of the aches and pains of the growth, and for the calming of the minds of the sufferers, but unworthy the serious consideration of pathologists who, holding either of the theories of the nature of the disease, yet hopefully seek some rational means of removing the local mischief.

For we may again remind ourselves that the mystery of the nature of cancer has almost entirely passed away. That we still know nothing of the proximate cause of the appearance of a malignant growth is an admission we may fearlessly make, since we know so little of the proximate cause of most of the morbid changes whose results are now so minutely studied by the morbid anatomist. But we no longer vex ourselves with the fruitless search for a specific cell-form or chemical test which shall distinguish cancers from other tumours.¹ If our micro-

¹ "The anatomical elements of cancer and tubercle are now known to have no special and peculiar characteristics, and they are believed to be as easily derivable from pre-existing tissues as are other non-specific morbid growths. A mere local change in the mode and intensity of pre-existing tissue-changes suffices to engender them."—"Epidemic and Specific Contagious Diseases," Introductory Address by Prof. Bastian, F.R.S., 'British Med. Journal,' Oct. 7th, 1871, p. 401.

scopic researches have taught us nothing more, at least they have taught us this,—that the most malignant tumours differ from the most innocent and benign only in certain physical conditions of structure or position which vary greatly in different specimens, and which by their variations seem to explain with sufficient clearness the corresponding varieties of malignant properties.

More than twenty years have passed since Dr. J. Hughes Bennett published his work on Cancer, with its able and (considering the period at which it was written) heretical chapter on “rational treatment,” and to-day we may still learn many a valuable lesson from its perusal. The operation which that distinguished physician on purely pathological grounds, so warmly advocated, we on the like ground, and strengthened by greatly extended histological researches, still contend for as the most certain means of eradication of the disease where it can be sufficiently boldly performed. Ablation by means of caustic has been vastly improved since then, and now forms one of the recognised modes of treatment of certain cancers. In the “prevention of the disease” we have made no progress, and if we have to admit the same with regard to “means of retardation and resolution,” it is probably because surgeons have not sufficiently considered the suggestions there referred to. The influence of “cold, dryness, pressure, and locality,” have been suffered to pass comparatively unnoticed, whilst all the heat of debate and profusion of conflicting experiences have been centred upon the operation and its results. Now that we are no longer baffled at the outset by a conviction of the constitutional and hopeless character of cancer, and are no longer willing to admit its “specific” nature, we may return with renewed ardour to the perusal of such encouraging works as those of Young, Travers, Recamier, Bayle, Arnott, Walshe, and Collis, prepared to weigh their evidence with the more favour and candour now that we can class cancers with all other new growths as far as any inherent and inveterate malignancy is concerned.

The practical application of the principles of treatment here advocated cannot be considered in the present essay. That they are not novel, and those who have employed them—in however limited an experience—have not been dissatisfied with the results, are facts greatly in favour of their being systematically

and thoroughly worked out by surgeons generally, instead of our being content to admit the virulence of the disease which combats all remedies, or to choose between an insufficient use of the knife, or an indiscriminate employment of bland and inoperative topical applications.

